

Listing of Claims:

1. (Currently Amended) An image-processing method for creating processed image data ~~by applying a spatial-filtering processing to~~ from source image data via an image-conversion processing including at least one spacial-filtering processing,
5 said method comprising the steps of:

setting ~~a~~ at least one predetermined upper-limit value for a variation amount ~~of said source image data indicating an amount of difference between said source image data and said processed image data;~~ before performing an image-conversion processing
10 through which said source image data are converted to said processed image data by applying said spatial-filtering processing; and then

performing said image-conversion processing ~~for~~ to convert said source image data into said processed image data by applying
15 said at least one spatial-filtering processing to the source image data within a range of said variation amount limited by said predetermined upper-limit value.

2. (Currently Amended) The image-processing method of claim 1, wherein said at least one spatial-filtering processing comprises a plurality of different spatial-filtering ~~processing(s)~~ processings, ~~characteristics of which are different~~

5 ~~each other,~~ a predetermined upper-limit value for a variation
amount is set for each of the plurality of spatial-filtering
processings based on characteristics of the respective spatial-
filtering processings, and the plurality of spatial-filtering
processings are performed either one of simultaneously in
10 parallel ~~or and~~ sequentially one by one. ~~in said image-conversion~~
~~processing, and said predetermined upper-limit value is set for~~
~~every spatial-filtering processing, corresponding to each of said~~
~~characteristics of them.~~

3. (Currently Amended) The image-processing method of
claim 2, wherein said plurality of spatial-filtering processings
comprise a first spatial filter , having a characteristic to
emphasize for emphasizing an amplitude of image data ~~residing in~~
5 a first spatial frequency band, ~~and also having a first~~
~~upper-limit value set as said predetermined upper-limit value,~~
and a second spatial filter , ~~having a characteristic to~~
~~de-emphasize for de-emphasizing~~ an amplitude of image data
~~residing in a second spatial frequency band; and also having~~

10 wherein a first upper-limit value is set as the
predetermined upper-limit value for the first spatial filter, and
a second upper-limit value is set as said the predetermined
upper-limit value for the second spatial filter; , are provided
~~in said plurality of spatial-filtering processing(s), and~~

15 wherein said first spatial frequency band is higher than
said second spatial frequency band, and said first upper-limit
value is greater than said second upper-limit value.

 4. (Currently Amended) The image-processing method of
claim 2, wherein said plurality of spatial-filtering processings
comprise a corresponding plurality of spatial filters ~~are~~
~~provided in said plurality of spatial-filtering processing(s),~~
5 and each of ~~them corresponding~~ said plurality of spatial filters
corresponds to ~~each~~ a respective one of said plurality of
spatial-filtering ~~processing(s),~~ processings; and

 wherein [[,]] each of said spatial-filtering processings is
only applied to pixel data when an absolute value of ~~said a~~
10 variation amount for the corresponding spatial-filtering
processing is higher than a predetermined lower-limit value, said
absolute value of the variation amount being derived by applying
said spatial-filtering processing to each pixel data value
corresponding to the spatial filter of ~~each of said plurality of~~
15 ~~spatial filters, is higher than a predetermined lower-limit~~
~~value,~~ said corresponding spatial-filtering processing. ~~is~~
~~applied to said pixel data.~~

Claims 5 and 6 (Canceled).

7. (Currently Amended) ~~The~~ An image-processing method ~~of~~
~~claim 6,~~ for creating a variable sized image by applying one of
an enlargement processing and a reduction processing to source
image data including a plurality of color components, said method
5 comprising:

applying a plurality of different spatial-interpolation
processing methods to said source image data, said
spatial-interpolation processing methods corresponding
respectively to said plurality of color components;

wherein at least one of said spatial-interpolation
processing methods for processing a corresponding one of the
color components is performed in accordance with a magnification
factor of said enlargement processing or reduction processing;

wherein said spatial-interpolation processing methods are
performed by employing weighted-addition average values of a
plurality of pixels, and based on look-up tables (LUTs) of
weighting coefficients [[,]] corresponding to said plurality of
spatial-interpolation processing methods; , are provided, and

wherein a new look-up table is created by performing a
weighted averaging operation in respect to with said look-up
tables in accordance with the magnification factor, and said at
least one spatial-interpolation processing method that is
performed in accordance with the magnification factor is
performed by employing the new look-up table. is further

~~performed in response to said magnification factor of either said enlargement or said reduction processing, in order to create new look-up tables for spatial interpolation processing(s).~~

Claim 8 (Canceled).

9. (Currently Amended) An image-processing method for creating processed image data by applying a spatial-filtering processing and ~~either~~ one of an enlargement ~~or processing and a~~ reduction processing to source image data, ~~under a condition that~~
5 ~~when~~ a magnification factor of ~~either~~ said one of the enlargement ~~or said processing and the~~ reduction processing is lower than a predetermined value, said method comprising ~~the steps of:~~

performing (i) a first size-varying processing to vary a size of an image ~~up~~ to a predetermined intermediate size,
10 ~~established in advance and an~~ (ii) a first angle-rotating processing to rotate ~~an angle of~~ said image ~~up to~~ by a predetermined first angle value; ~~being a predetermined rotating angle,~~

applying said spatial-filtering processing to image data
15 processed by said size-varying processing and said angle-rotating processing; and

performing ~~again said~~ (i) second size-varying processing to further vary said size of said image ~~up to an~~ a predetermined

objective size, ~~also established in advance and said (ii) second~~
20 ~~angle-rotating processing to reversely rotate said angle of said~~
~~image up to by a second angle value, said second angle~~
value being opposite said first angle value.

Claims 10 and 11 (Canceled).

12. (Currently Amended) ~~The~~ An image-processing method ~~of~~
~~claim 11, further comprising the steps of:~~

extracting a plurality of couples of pixels, each of said
couples of pixels comprising two pixels positioned symmetrically
5 with respect to an objective pixel to be processed through an
image-processing;

calculating differential values between said two pixels and
said objective pixel for each of said plurality of couples of
pixels;

10 extracting a specific couple of pixels having a minimum
differential value out of said plurality of couples of pixels;

when said minimum differential value is lower than a
predetermined first threshold value, setting a weighted-addition
average value of said specific couple of pixels and said
15 objective pixel, as a new value of the objective pixel;

establishing a new threshold value ~~, which is obtained~~ by adding a predetermined positive value to said minimum differential value;

20 extracting all of ~~specific~~ the couples of pixels ~~[[,]]~~
having differential values ~~of which are~~ lower than said new threshold value ~~, out of said plurality of couples of pixels;~~ and
setting an average value of ~~image data, included in~~ of said ~~specific~~ extracted couples of pixels, as a value of ~~a noticed~~ the objective pixel.

Claim 13 (Canceled).

14. (Currently Amended) An image-processing method for processing source image data, said method comprising ~~the steps~~ of:

5 setting a predetermined first threshold value ~~predetermined~~
~~in advance~~ and a maximum radius from a noticed pixel to an
objective pixel in the source image data, said noticed pixel
being a pixel to be processed by an image-processing, ~~to an~~ and
said objective pixel ~~[[,]]~~ being an object for comparison ~~, with~~
~~respect to said source image data;~~

10 applying a signal-smoothing processing to said source image data based on the ~~basis of said~~ first threshold value and a

differential value between said noticed pixel and said objective pixel to generate second source image data;

15 setting a second threshold value, which is smaller than said first threshold value, and ~~a~~ an expanded radius, which is larger than said maximum radius; and

 applying ~~again~~ said signal-smoothing processing to said second source image data based on the second threshold value and the expanded radius.

15. (Currently Amended) The image-processing method of claim 14, wherein said source image data ~~are~~ is obtained by applying a gradation-converting processing to image data outputted by an image inputting apparatus, and at least one
5 of said first threshold value and/or and said second threshold value ~~are/is found~~ is determined based on the basis of gradation-conversion characteristics in the vicinity of a signal value of said noticed pixel ~~to be processed by said image-processing.~~

16. (Currently Amended) An image-processing method for processing source image data including a plurality of color components to convert said source image data into processed image data, each of ~~which includes~~ said plurality of color components
5 including three data sets ~~of at least three dimensions,~~

including one ~~of~~ data set which represents brightness information, and ~~another~~ two ~~of~~ data sets which represent chrominance coded information, said method comprising ~~the steps~~ of:

- 10 applying a first spatial-filtering processing to ~~a~~ the data set representing said brightness information; and
- applying a second spatial-filtering processing to all of said three data sets;
- wherein a ~~power~~ capacity for emphasizing a low-spatial
- 15 frequency region is greater in said second spatial-filtering processing ~~is greater~~ than ~~that~~ in said first spatial-filtering processing.

17. (Currently Amended) The image-processing method of claim 16, further comprising ~~the step of:~~ performing a color coordinate-converting processing ~~by~~ in which said brightness information and said chrominance coded information are converted

5 to ~~each of~~ color component signals, after applying said first spatial-filtering processing and before applying said second spatial-filtering processing.

18. (Currently Amended) An image-processing apparatus for processing an image, comprising:

an image-inputting section to acquire image data of a source image from an image recording medium or a document having said source image thereon;

an image-processing section to apply ~~an~~ the image-processing method recited in claim 1 to said image data acquired by said image inputting section, so as to create processed image data; and

an image-outputting section to output said image in ~~either~~ at least one of: a first mode ~~that~~ in which said processed image data ~~are~~ is written onto an information-recording medium, ~~or~~ a second mode ~~that~~ in which said processed image is ~~written on an image recording medium to obtain a hardcopy printed, or and~~ a third mode ~~that~~ in which said processed image data is displayed on an image-displaying device. [[:]]

~~wherein said image-processing section employs anyone of the image-processing methods described in claims 1-17.~~

19. (Original) An image-processing method for creating processed image data by applying a spatial-filtering processing and a size-converting processing in an enlarging direction to source image data, comprising the steps of:

5 determining whether an effect of a sharpness-emphasizing processing, to be performed in said spatial-filtering processing, should be relatively strong or weak, based on instructive

information in regard to image-processing items inputted in advance; and

- 10 applying said spatial-filtering processing at first, and then, said size-converting processing to said source image data, when determining that said effect of said sharpness-emphasizing processing should be relatively strong; or
- 15 applying said size-converting processing at first, and then, said spatial-filtering processing to said source image data, when determining that said effect of said sharpness-emphasizing processing should be relatively weak.

20. (Original) An image-processing apparatus for processing an image, comprising:

5 an image-inputting section to acquire image data of a source image from an image recording medium or a document having said source image;

 an instructive-information inputting section to input instructive information in regard to image-processing items to be performed in said image-processing apparatus;

10 an image-processing section to apply an image-processing to said image data acquired by said image inputting section, so as to create processed image data; and

 an image-outputting section to output said image in either a first mode that said processed image data are written onto an

information-recording medium, or a second mode that said image is
15 written on an image recording medium to obtain a hardcopy, or a
third mode that said image is displayed on an image-displaying
device;

wherein said image-processing section determines whether an
effect of a sharpness-emphasizing processing, to be performed in
20 a spatial-filtering processing, should be relatively strong or
weak, based on said instructive information in regard to said
image-processing items inputted by said instructive-information
inputting section; and

wherein said image-processing section applies_said
25 spatial-filtering processing at first, and then, said
size-converting processing to said image data, when determining
that said effect of said sharpness-emphasizing processing should
be relatively strong; or said image-processing section applies
said size-converting processing at first, and then, said
30 spatial-filtering processing to said image data, when determining
that said effect of said sharpness-emphasizing processing should
be relatively weak.

Claims 21 and 22 (Canceled).

23. (Original) The image-processing method of claim 16,
wherein said second spatial-filtering processing further
comprises the steps of:

finding sum-of-product values between noticed pixels and
5 peripheral pixels;

establishing said sum-of-product values as values of said
noticed pixels; and

extracting said peripheral pixels, to be employed for a
calculation, out of a plurality of discontinuous pixels, wherein
10 distance intervals for extracting said peripheral pixels are
unequal relative to each other.